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On February 17, 2019, Martha Quinto from our office visited two elementary schools in Stamford with possible mold issues related to plumbing and fire protection systems.

The following is a summary of her observations and recommendations at each school:

KT Murphy

1. General Observations: The plumbing and sprinkler systems observed were in well-maintained and free of leaks. Piping requiring insulation to prevent condensation and or heat loss was generally adequately and thoroughly insulated. There were a few isolated cases of uninsulated domestic water piping routing exposed in small toilet rooms to reach single fixtures (Nurse's T.R., 2nd floor Room 24A T.R.)

Some horizontal storm piping in the Gym was also lacking insulation.

Isolated incidences of ceiling tile water staining did not appear to be related to plumbing or sprinkler systems.

During a previous visit for another project, a ‘septic’ smell was noticed at the toilet rooms at the rear of the auditorium; this odor was not observed during this visit.

Boy’s Room – 3rd Floor: Rusting escutcheons were found, probably due just to age and regular use/maintenance.

2. The reported open sump pump installation on the lower level of the newer building portion exists. The triangle-shaped open sump is formed by concrete foundation walls creating the base of a wall cavity located on the north auditorium wall, near the stage. The cavity is accessible via a low wall access door opening into the adjacent Corridor.

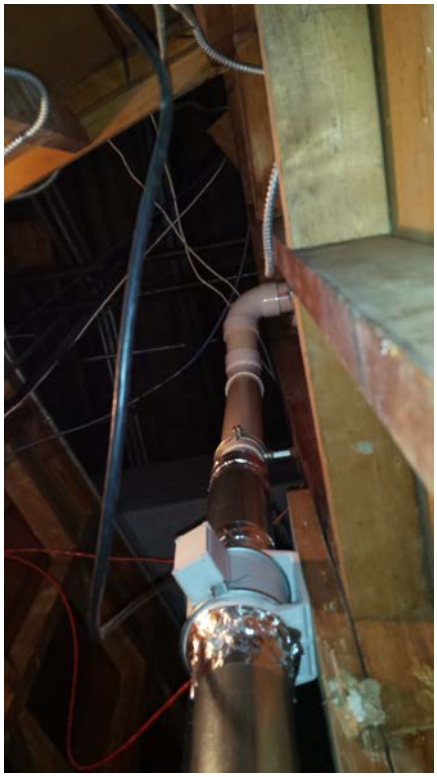
Water (presumably ground water) collects within the open cavity, and was visible about 3-4 feet below the Corridor finished floor. A submersible sump pump has been installed in the cavity, within a large diameter plastic pipe surround.

Pump discharge was piped into a storm main dropping to below grade in the same wall cavity.

How the water transfers into the cavity and plastic pump surround could not be verified.

A Drain Master Jr. chemical dosing controller and an empty gallon container of bio-enzymatic odor digester were also found in the cavity.

An in-line fan (Soler-Palau TD-100) has been installed to transfer air into or out of the cavity:



Pump and fan are plugged into a combination switch and duplex power receptacle located within the wall cavity, about 18 inches above finished Corridor floor (with single light switch above):

Toggling the switch on and off had no apparent effect on the fan's very low air flow, and the pump did not operate, presumably because pump start/shutoff is controlled through liquid level sensing.

As the sump is open to building atmosphere, with standing water even when the water level does not activate the pump, a moist condition exists that cannot be prevented. Since the front seating in the auditorium is about 3 feet below finished Corridor floor, the groundwater is particularly detrimental to that space.

Recommendations:

1) The optimum solution is to eliminate the collection of groundwater under the building slab. This would probably entail a widespread installation of perforated drainage piping, collecting to a larger sump pump/basin.
2) Unless groundwater level is greatly reduced, it appears that the sump is necessary to prevent water damage in the auditorium's lower areas. A sump basin with vapor tight cover and piped inlet should be installed, and the remaining surface area of the cavity (at corridor floor level) sealed up with concrete.

3. Fire Service Entrance Room: This room has been exposed to excessively moist conditions as evidenced by corroded condition of some piping and valves, and rusty water stains on walls. Rotted wood flooring covers what appears to be a floor cavity, possibly an open drain. The water damage and staining appears recent (staining over intact red pipe paint), and worse in the vicinity of the backflow preventer, which is a double check type, without relief discharge. Perhaps backflow preventer malfunction causes the water damage and staining.

Recommendations: Verify history and source of the moisture and staining. Assure that all major test/drain piping is directed outside and drains adequately away from the building. Assure all minor/auxiliary drain piping that cannot drain by gravity to outside is directed to a viable drainage system.

Hart

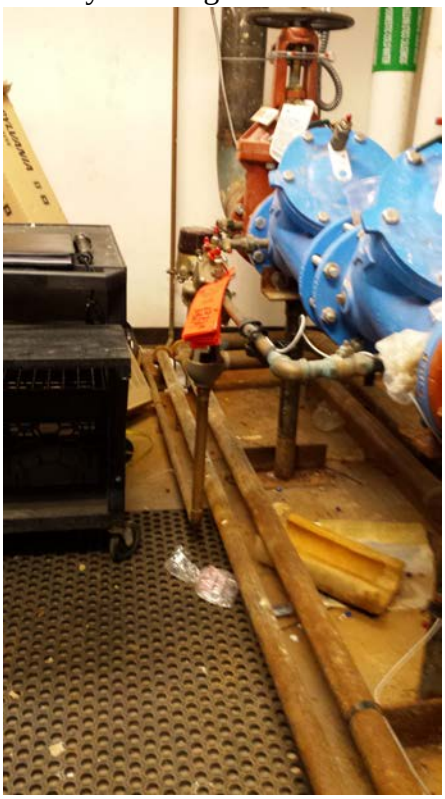
1. General observations: The plumbing piping systems and fixtures observed throughout were in generally leak-free condition, and piping requiring insulation to prevent condensation and or heat loss was adequately and thoroughly insulated. Roofs appear to be well-drained, though there was some standing water at the north east corner of the Gym roof.

2. Some pitting/corrosion was observed on galvanized dry sprinkler system piping where it passes into the boiler room from the Water Room and Custodial Office to the south. This may be due to condensation; this section of piping appears to have been repaired already:

3. Engineers were advised by maintenance personnel (as were architects visiting separately), that the “septic” smell in the Music Room is most likely being generated by the grease trap located in the adjacent kitchen. While the kitchen is in close proximity to the Music Room, no septic smell was observed in the Music Room or in the Kitchen during our visit. Although many gas regulator vents open to atmosphere near this area, the complaint was confirmed to be about ‘septic’ rather than ‘natural gas odorant’ smells. Further field investigation regarding the nature and

location of the grease trap waste and vent piping is required, as Plumbing drawings were not found in the Hart drawing set made available for review.

4. Fire and Domestic Water Service Entrance Room: Major pressurized sprinkler test piping is not discharged to the exterior of the building. Instead, main sprinkler tests, along with the domestic water service's backflow preventer relief discharge, are open-ended in the vicinity of a single floor drain.



This arrangement is not sufficient to keep up with the discharge rate of any of these devices. For instance, NFPA 13 states that sprinkler main drain test connections “shall be so installed that the valve can be opened wide for a sufficient time to assure a proper test without causing water damage.” In the case of Hart School, to adequately test the backflow preventer in a forward manner at sprinkler system design flow rate, the drain needs to discharge approximately 300 GPM. Furthermore, the 4” reduced pressure backflow preventer’s relief, at 100 psi static pressure, is capable of a worst case 700 GPM discharge rate. Under these circumstances, the floor drain would be quickly overwhelmed and flooding inevitable.

Recommendations:

1) Sprinkler system main drain test connections should be piped directly to outside, with auxiliary drains provided to gravity-drain trapped, non-pressurized portions after the main drain test valve is closed.
2) The domestic water service’s reduced pressure backflow preventer should be fitted with a water relief discharge sensor interlocked with an automatic service shutoff valve located upstream of the backflow preventer. If the backflow preventer experiences mechanical failure or clogging and the relief fails “open”, the automatic valve will shut off the water service to prevent further relief discharge.